

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

20 AUG 2004

PCT Application
PCT/JP2003/001591



Applicant's or agent's file reference SC03PCT2	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP03/01591	International filing date (day/month/year) 14 February 2003 (14.02.03)	Priority date (day/month/year) 21 February 2002 (21.02.02)
International Patent Classification (IPC) or national classification and IPC C09J 5/00, H05K 3/36, C09J 201/00, 163/00		
Applicant SONY CHEMICALS CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 09 April 2003 (09.04.03)	Date of completion of this report 31 July 2003 (31.07.2003)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP03/01591

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
 pages 1-14, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages 2, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages 1, 4-9, filed with the letter of 18 July 2003 (18.07.2003)
- ☒ the drawings:
 pages 1-12, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. 3
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

See supplemental sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. _____

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

The feature common to claims 1, 2 and 4-9 is "a method for manufacturing an electrical device, in which two objects are bonded to each other which are a first object having a first electrode and a second object which has a second electrode which has to be connected with the aforementioned first electrode and fabricating an electric device comprising an aforementioned first connecting object and second connecting object, wherein the method for fabricating an electrical device comprises: a step of forming an adhesive layer by placing an adhesive having a first hardener in which the main constituents are a thermosetting resin and a silane coupling agent on at least the aforementioned first electrode; a step of forming a second hardener layer by placing a hardener in which the main constituent is either a metal chelate or metal alcoholate or both which reacts with the aforementioned first hardener on heating and causes the polymerization of the aforementioned thermosetting resin on at least the second electrode; a step of aligning the positions of the aforementioned first electrode and aforementioned second electrode; a step of bringing the aforementioned adhesive on the aforementioned first object into contact with the aforementioned second hardener on the aforementioned second connecting object; a step of pressing the aforementioned first and second objects and connecting the first and second electrodes as well as polymerizing the aforementioned thermosetting resin by means of heat", set forth in claim 1. However, the results of the international search indicate that the aforementioned common feature could be derived easily by combining

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

disclosures in the documents listed in box V in a manner obvious to a person skilled in the art and, therefore, does not involve an inventive step and cannot be identified as a special technical feature in the sense of PCT Rule 13.2.

Since there is no other common feature which can serve as a special technical feature, Claims 1, 2 and 4-9 do not constitute a group of inventions so linked as to form a single general inventive concept.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1, 2, 4-9	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1, 2, 4-9	NO
Industrial applicability (IA)	Claims	1, 2, 4-9	YES
	Claims		NO

2. Citations and explanations

Document 1: JP 7-82533 A (Hitachi Chemical Co., Ltd.), 28 March 1995; claims and paragraphs [0013] and [0016]-[0030] (Family: none)

Document 2: JP 7-26235 A (Toshiba Chemical Co., Ltd.), 27 January 1995; claims (Family: none)

Document 3: JP 2001-303013 A (Ube Industries, Ltd.), 31 October 2001; claims and paragraphs [0018]-[0027] (Family: none)

Document 4: JP 2000-230091 A (Kanegafuchi Chemical Industry Co., Ltd.), 22 August 2000; claims and paragraphs [0025]-[0027] (Family: none)

Document 1 above, cited in the international search report, discloses a bonding method wherein a bonding layer comprising an epoxy-group-containing silane coupling agent and a cyclic epoxy resin is formed on one bonding surface and a bonding layer of a hardening adhesive composition containing a cationic thermopolymerization starter is formed on the other bonding surface, and both bonding surfaces are placed face to face heat and pressure are applied; it also discloses the feature of mixing electrically conductive particles into an aforementioned adhesive when carrying out electrically conductive bonding, and using such an electrically conductive

adhesive to bond electrodes together.

In addition, documents 2, 3 and 4 above, cited in the international search report, each disclose concurrent use of a silane compound having hydrolysable groups and an aluminium chelate compound or alcoholate in an epoxy type electrically conductive adhesive composition.

Therefore, given the disclosures in documents 2-4, a person skilled in the art could easily conceive of using a hardener system comprising a combination of a silane compound and an aluminium chelate compound or alcoholate instead of a hardener system comprising a silane compound and another hardener in the invention disclosed in document 1; and there is no evident technical contribution from such a substitution. Therefore, the inventions set forth in claims 1, 2 and 4-9 do not involve an inventive step.

CLAIMS

1. (Amended) A method for producing an electrical device made up by a first object for bonding including a first electrode and a second object for bonding including a second electrode to be connected to said first electrode, by bonding said first object for bonding and said second object for bonding to each other, comprising the steps of

arranging an adhesive, mainly containing a thermosetting resin and a silane coupling agent, at least on said second electrode, to form an adhesive layer;

arranging a second curing agent, reacted with said first curing agent by heating to polymerize said thermosetting resin, at least on said second electrode, to form a layer of the second curing agent, said second curing agent being mainly composed of one of both of a metal chelate and a metal alcoholate;

positioning said first and second electrodes in register with each other;

tightly contacting said adhesive on said first object for bonding with said second curing agent on said second object for bonding; and

thrusting said first and second objects for bonding against each other for interconnecting said first and second electrodes and allowing said thermosetting resin to be polymerized by heating.

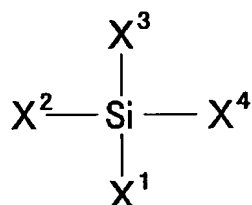
2. The method for producing an electrical device according to claim 1 wherein electrically conductive particles are added to said adhesive from the outset and wherein said first and second electrodes are interconnected via said electrically

conductive particles.

3. (Deleted)

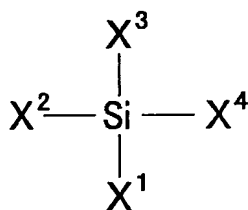
4. (Amended) The method for producing an electrical device according to claim 1 wherein said metal chelate one of ethyl acetoacetate aluminum diisopropylate, alkyl acetoacetate aluminum diisopropylate and aluminum monoacetyl acetate bis ethylacetoacetate.

5. (Amended) The method for producing an electrical device according to claim 1 wherein a compound represented by the following formula:



is used as said silane coupling agent. where at least one of the substituents X^1 to X^4 is an alkoxy group and at least one of the substituents different from the alkoxy group includes an epoxy ring.

6. (Amended) The two-component adhesive according to claim 1 wherein, as said silane coupling agent, a compound shown by the following formula:



is used, where at least one of the substituents X1 to X4 is an alkoxy group and at least one of the substituents different from the alkoxy group includes an epoxy ring, and where said substituent including the epoxy ring is a glycidyl group.

7. (Added) The method for producing an electrical device according to claim 1 wherein said thermosetting resin forming said adhesive layer is an epoxy resin and wherein said second curing layer further contains an epoxy resin.

8. (Added) The method for producing an electrical device according to claim 1 wherein said second curing layer is formed by spraying said second curing agent liquid at ambient temperature or a liquid dispersion containing said second curing agent dispersed therein.

9. (Added) The method for producing an electrical device according to claim 1 wherein said second curing layer is formed by coating said second curing agent liquid at ambient temperature or a liquid dispersion containing said second curing agent dispersed therein.